

DISTRIBUTION AND POPULATION STATUS OF THE OTTER (*LUTRA LUTRA*) IN THE LOCH LOMOND AREA.

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ABSTRACT

Loch Lomond is thought to be an important site for otters (*Lutra lutra*) as it is the largest area of freshwater in mainland Britain and has one of the most diverse fish communities of any area of freshwater in Scotland. Between 2001 and 2003 a spraint survey indicated that otters were widespread throughout Loch Lomond and its tributaries and there had been an increase in the proportion of tributaries with otters present since the late 1970s. The variety of prey in the loch and the suitability of habitat suggest that the area is highly favourable for otters at the present time. Continued monitoring of the otter population is recommended, given the region's new status as Scotland's first National Park and concerns about human activity in the area.

INTRODUCTION

Loch Lomond is the largest area of freshwater in mainland Britain, it has one of the most diverse fish communities of any area of freshwater in Scotland (Adams 1994) and therefore it is likely to be an important ecosystem for the otter (*Lutra lutra*). Otters have been recorded in Loch Lomond since the 1800s (Gibson 1984; Gibson and Mitchell 1986) and surveys of Scotland in the past three decades found signs of otters on most tributaries and several areas of the loch shore (R. Green unpublished data).

Within the past 30 years otter populations in Scotland and throughout Europe have been expanding, reversing a major decline that began in the 1950s. The previous decline of the otter has been attributed to a variety of causes including hunting and persecution, accidental mortality, the release of persistent contaminants, a reduction in water quality, habitat loss and increased disturbance (Green and Green 1997). Although the favourable status of otter populations at the present time would indicate that many of these factors have been reduced, continued monitoring of otters is required to avoid future threats throughout its range.

Loch Lomond and the Trossachs was established as Scotland's first National Park in July 2002. Although this may provide an extra level of protection for the environment in the region there is justifiable concern about levels of pollution in the loch and the effects of increasing recreational pressure on the area (Bannan *et al.* 2001; Mitchell 2001). The aim of this study was therefore to determine how widely distributed otters are within the Loch Lomond area and identify suitable sites for future monitoring of the population.

METHODS

The presence of otters was determined by searching for signs (spraints, tracks and prey remains) between October 2001 and December 2002. Road bridges across the main tributaries of Loch Lomond were taken as sampling points and an area of approximately 200 m on either side of each bridge was searched. Searches were stopped when signs of otters had been found. Four areas of the loch shore were also systematically searched each month from January to December 2002 to determine the year round presence of otters using the loch. The sites were distributed along the Eastern shore of the loch and were located at: Endrick mouth (NS 427877), Ross Point (NS 375956), Inversnaid (NN 339075) and Ardleish (NN 327153). A length of approximately 1 km of shoreline was searched for signs. Spraints were collected for future analysis and to prevent duplicate recording between months. In addition, signs of otters were recorded opportunistically on visits to the loch between October 2001 and May 2003.

The occurrence of otters in the Loch Lomond area was compared with previous records collected during the National Otter Surveys of Scotland in 1977-9, 1984-5 and 1991-4 (R. Green unpublished data).

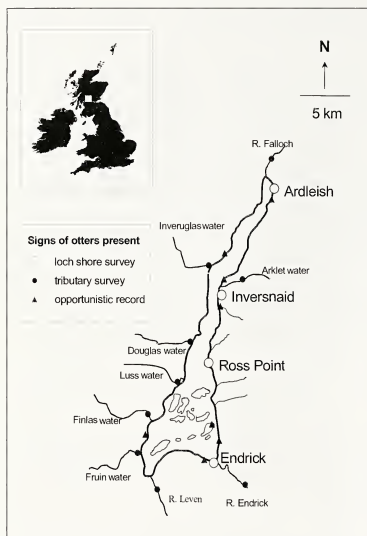
RESULTS

Otters were found to be widespread throughout Loch Lomond and its tributaries (Fig. 1). Signs of otters were recorded on all major rivers entering the loch and on the river Leven leaving the loch (Table 1). Otter spraints and tracks were observed in a number of shore locations, including the northern shore of the island Inchcailloch (Fig. 1).

Table 1. Loch Lomond tributaries that were searched for presence of otters between October 2001 and December 2002. All locations showed signs of spraint except Fruin Water which showed tracks. All had been surveyed previously except for Arklet burn.

Location	Grid Ref.	Date
River Falloch	NN 319188	11.04.02
Inveruglas water	NN 320093	18.12.02
Arklet burn	NN 354094	29.06.02
Douglas water	NS 345979	13.06.02
Finlas water	NS 354881	12.10.01
Fruin water	NS 356857	12.10.01
Luss water	NS 358926	12.10.01
River Leven	NS 393792	25.07.02
River Endrick	NS 473874	22.05.02

Fig. 1. Location of otter signs found at Loch Lomond and its tributaries between October 2001 and May 2003. Signs of otters were recorded from systematic searches at four main shorelines (○) and on main tributaries (●). Opportunistic records of spraints are also shown (▲). The geographical location of Loch Lomond is given (□).



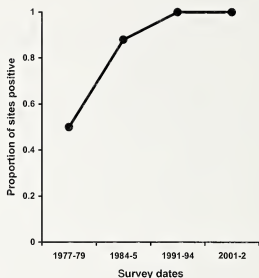
Comparison between this study and previous records indicated that there had been an increase in the proportion of tributaries with otters present from 0.5 to 1.0 between the late 1970s and 2002 (Fig. 2). Spraints and tracks of otters were seen at all four shore sites that were checked each month. The number of spraints found during each visit varied considerably. The greatest difference was seen at Ross Point with between 3 and 21 spraints found per visit in May and January 2002, respectively. In addition, mink (*Mustela vison*) scats were seen at all shore areas searched each month.

DISCUSSION

Distribution

This study was relatively limited in extent and restricted to the large tributaries and four main areas of shoreline of Loch Lomond. Nevertheless it provided useful base-line data for monitoring purposes. The area has a wide diversity of suitable habitats for otters ranging from the extensive shallow littoral zone of the loch itself to small lochans, rivers, streams and marshland. The diverse

Fig. 2. Proportion of Loch Lomond's main tributaries (n = 8) recorded positive for presence of otters.



fish community provides a wide prey base to support the otter population. At least nine fish species and two amphibians have been recorded in otter spraints from Loch Lomond, with the introduced ruffe (*Gymnocephalus cernuus*) being the most frequently recorded species in the diet (McCafferty *In press*).

Population status

The increase in positive records of otters in Loch Lomond's tributaries since the late 1970s is in line with the increasing expansion of otter populations in Scotland as a whole, with otters now distributed over more than 90 % of available habitat (Green and Green 1997). The methods used in the previous National Otter Surveys involved searching a 600 m length of river at bridges. Although only 200 m was searched in this study, all sites had signs of otters and therefore the difference in methodology would not have biased the proportion of positive sites recorded.

The large area of loch Lomond could potentially support a sizeable otter population. However, the population size of an area such as Loch Lomond is unknown. A study by Green *et al.* (1984) of otters in the River Earn catchment (Perthshire) recorded 7 or 8 family groups on 98 km river with an average of 0.75 breeding females per 10 km of river. Erlinge (1967) in comparison recorded 3.6 – 5.6 otters per 10 km lakeshore in Southern Sweden. Loch Lomond has a shore length of approximately 80 km (not including islands) and an extensive river catchment providing suitable habitat for a relatively large population.

This study also found evidence of mink throughout the length of the loch. Mink are known to be widespread in the area (Mitchell 2001). Mink farms were previously established at Gartocham, close to the southern end of the loch and at Fintry in the

River Endrick catchment where colonisation of the river was noted from 1964 onwards (Gibson 1984). There is overlap in the diet of otters and mink but mink generally take a greater proportion of aquatic birds and mammals (Jenkins and Harper 1980; Wise *et al.* 1981). In England otters are now recolonising river catchments where mink are present, whereas in Scotland mink became established during a period when otters were present. Competition between mink and otter in the Loch Lomond area is therefore unlikely to affect the status of the otter population. More important may be the interaction between humans and otters within the area. Otters have been recorded killed on the road near the Luss and Fruin Waters in recent years (R. Green unpublished data), giving concern that increased road traffic in the area may lead to an increase in mortality. Levels of hydrocarbons recorded within the surface waters of the loch have risen in the past 10 years with the increase in powerboat use for recreation (Bannan *et al.* 2001). Although it is not known the extent to which these may be incorporated into the aquatic ecosystem, its impact on top predators such as otters may be worthy of attention.

Future Monitoring

Studies have previously indicated that there is no simple relationship between the number of otter spraints and the abundance of otters in an area (Chanin 1985; Mason and Macdonald 1986). Sprainting behaviour appears to be dependent on a number of factors including age, social status, sex and season of the year and spraints are also washed away during periods of high water. Although spraints and tracks are unable to provide a reliable estimate of otter numbers, it is the simplest and least expensive method of monitoring at the present time. However, different approaches may be required to examine how the otter population may be affected by pollution or increased human activity.

ACKNOWLEDGEMENTS

Thanks to Colin Adams and all staff at the University Field Station Rowardennan for assistance throughout the project. Rosemary Green kindly provided unpublished records from previous otter surveys and gave valuable comments on an earlier draft of the manuscript. Forest Enterprise (Aberfoyle), Scottish Natural Heritage (Stirling), the Royal Society for the Protection of Birds, the Falloch Estate and Loch Lomond Golf Club kindly gave permission to access field sites. The work was funded by a grant from the Blodwen Lloyd-Binns Bequest (Glasgow Natural History Society).

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